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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,456

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David Champion

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EXAMINER

ONEILL, KARIE AMBER

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/699,456

Applicant(s)

CHAMPION ET AL.

Examiner

Karie O'Neill

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20, 48, 49 and 65-67 is/are pending in the application.
- 4a) Of the above claim(s) 65-67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20, 48 and 49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 65-67 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Remarks***

1. Applicant's amendment filed on June 29, 2006, was received. Claims 1-20, 48, 49 and 65-67 are pending in this Office Action. Claims 1, 15, 48 and 49 have been amended. Claims 21-47 and 50-64 are cancelled without prejudice. Claims 65-67 have been added as new.

### ***Election/Restrictions***

2. Newly submitted claim 65 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of the aforementioned claim is a single chamber fuel cell, which has a different mode of operation than the "fuel cell" as recited in the original claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 65 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

3. Newly submitted claims 66 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of the aforementioned claim is a fuel cell comprising a substrate, wherein a plurality of nanowires if connected to at least one of catalytic particles or electrolyte grains, which is a distinct species from the "fuel cell comprising a substrate and a

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patterned film established on the substrate, the patterned film having a plurality of nanowires dispersed therein” as recited in the original claim.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 66 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

4. Newly submitted claim 67 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The subject matter of the aforementioned claim is a fuel cell comprising a substrate, wherein the plurality of nanowires is formed from electrolyte filament materials and wherein cathode nanoparticles are dispersed on and connected to the electrolyte filament material nanowires, which is a distinct species from the “fuel cell comprising a substrate and a patterned film established on the substrate, the patterned film having a plurality of nanowires dispersed therein” as recited in the original claim.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim\*\*\* withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-20, 48, and 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (US 2005/0053826 A1).

With respect to Claims 1-4 and 49, Wang et al. disclose, a fuel cell comprising: a substrate, wherein the substrate is an electrolyte made of a polymer proton exchange membrane (PEM) (paragraphs 0083 and 0086); and a patterned platinum alloy thin film catalyst is deposited or dispersed throughout the film with carbon nanotubes which directly contact the PEM substrate (paragraphs 0082 and 0083); wherein the plurality of nanotubes enhances catalytic activity and conductivity of the patterned film and increases the number of sites per unit volume where catalysis takes place (paragraphs 0018 and 0035). From the specification of Applicant's invention, it is to be understood that a homogenous suspension, having nanowires therein, may be patterned into a predetermined configuration depending on the end use (page 7 lines 25-30). According to the Wang et al. reference, Figure 12 shows how the substrate, including the thin film containing nanowires, is a preferred three-layered structure with an optimized porosity and thickness that is the most efficient and economic for the particular fuel cell being

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used (paragraph 0085). It is also noted in the Wang et al. reference that nanoparticles can take any number of possible morphologies and still be suitable for use in the invention. For example, nanotubes of various kinds are used, including nanocoils, nanorods, nanowires, nanohorns, nanocages, nanococoons, and various shapes and sizes including twisted, straight, bent, kinked, curled, flattened and round (paragraph 0055).

With respect to Claims 5-14, Wang et al. disclose in an other embodiment, the fuel cell of Claim 1 wherein the substrate is at least one of a current collector material made of one or more carbon fibers, a porous carbon substrate, and a porous electrode sheet (paragraph 0021), the plurality of nanowires is formed from carbon nanoparticles seeded with one or more catalysts from the group consisting of platinum, nickel, copper and alloys thereof (paragraphs 0018 and 0057) and wherein the film comprises an anode and a cathode which is disclosed in paragraph 0019 as stating the invention provides an electrode/membrane combination comprising a first fuel cell conductive electrode (anode) comprising a first catalyst and a second fuel cell conductive electrode (cathode) comprising a second catalyst, where the first and second catalysts are independently selected and can comprise the same or different nanoparticles and/or thin films. Wang et al. discloses in paragraphs 0038-0039, the anode and cathode materials being fabricated from platinum and ruthenium, which are metallic components contained within the nanowires. Claims 7 and 8 are considered optional and anticipated by applied reference.

With respect to Claims 15-19, Wang et al. disclose the plurality of nanowires being randomly oriented throughout the patterned film (Figure 1), wherein the plurality of nanowires have a length less than about 200  $\mu\text{m}$  and a diameter of about 10 to 100 nm (paragraph 0018).

With respect to Claims 20 and 48, Wang et al. disclose in paragraph 0091, an electronic device comprising a load and the fuel cell of Claim 1 being operatively connected to the load or device such as electric vehicles, computers, cell phones, home electrical power generation systems and the like.

### ***Response to Arguments***

8. Applicant's arguments filed June 29, 2006, have been fully considered but they are not persuasive. Applicant recites that in the Wang et al. reference, none of the techniques used result in a patterned film having the nanowires dispersed therein. Examiner asserts that, in the specification of the instant application, the term patterned is a predetermined configuration depending on the end use, and this can be seen in the layering technique of the substrate, thin film coating and nanowires, as seen in Figures 12 and 14. The nanowires being dispersed within the film still read on the Wang et al. reference because the nanowires are coated with a film and are still considered to be dispersed or distributed throughout the film. Therefore, the amended claims do not overcome the prior art.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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PRIMARY EXAMINER

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Art Unit 1745